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**(54) FREQUENCY SWITCHING TYPE SURFACE MOUNTING ANTENNA, ANTENNA DEVICE USING THE ANTENNA AND COMMUNICATION UNIT USING THE ANTENNA DEVICE**

## (57) Abstract:

**PROBLEM TO BE SOLVED:** To provide an antenna which can cope with plural frequency bands by switching the grounded and non-grounded states of a control electrode that is placed near the open end of a radiation electrode via a gap and accordingly switching the resonance frequency of the antenna.

**SOLUTION:** A ground electrode 3 is formed on the entire surface of one of both main sides of a rectangular parallelepiped-shape dielectric substrate 2 together with a radiation electrode 4 formed on the other main side of the substrate 2 respectively, and one of both ends of the electrode 4 is grounded. In such a constitution, a surface mounting antenna 1 is produced. The signal inputted to a feeding electrode 6 from a signal source 10 is inputted to the electrode 4 via a 1st gap 5 formed near the open end of the electrode 4. Thus, the electrode 4 resonates as a microstrip line resonator whose one of both ends is opened with the other end

having its short circuit length of  $\lambda/4$ . A control electrode 8 is placed near the open end of the electrode 4 via a 2nd gap 7, and the grounded and non-grounded states of the electrode 8 are controlled by a switch 9. When the switch 9 is turned on, the capacities generated between the electrode 4 and the electrode 8 are applied in parallel to each other to lower the resonance frequency.

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